

- (i) find the first five terms and the sum of the first five terms of the corresponding series
- (ii) determine the value of the twentieth term.

6. FOR THE SEQUENCE $\{2^{n-1} + 5\}$, determine the first and seventh terms.

- (i) The number 261 belongs to the sequence, which term is it?
- (ii) Evaluate $\sum_{n=1}^5 (2^{n-1} + 5)$

7. DETERMINE THE FIRST FOUR TERMS OF EACH OF THE FOLLOWING SEQUENCES

- (i) $\left\{\frac{2n+3}{3n+1}\right\}$
- (ii) $\{3^n - 2^n\}$
- (iii) $\{(-1)^n(5n-2)\}$
- (iv) $\left\{\frac{x^n}{n}\right\}$
- (v) $\{a + (n-1)d\}$
- (vi) $\{ar^{n-1}\}$

8. (i) WHICH TERM of the sequence $\{7n - 5\}$ IS 198?

- (ii) PROVE THAT 12/17 belongs to the sequence $\left\{\frac{n-3}{n+2}\right\}$
- (iii) DETERMINE WHETHER 96 belongs to the sequence $\{u_n\}$ WHERE $u_n = 3 \cdot 2^{n-4}$.
If it does, state which term it is.

9. FIND THE SUM OF THE FIRST FIVE TERMS OF THE SERIES WHOSE n-th TERM IS $7n-15$.

10. EVALUATE THE FOLLOWING

- (i) $\sum_{r=1}^5 (6-2r)$
- (ii) $\sum_{r=1}^4 r^3$
- (iii) $\sum_{r=1}^3 (3^r - 2^{r-1})$
- (iv) $\sum_{r=1}^6 (-1)^r r$
- (v) $\sum_{r=1}^4 (2r^2 - 3r + 1)$
- (vi) $\sum_{r=1}^{10} (-1)^{r+1}$

11. (We can write sums often more concisely using sigma (Σ) notation:
Thus $1^2 + 2^2 + 3^2 + 4^2 + \dots + 20^2 = \sum_{r=1}^{20} r^2$)

WRITE THE FOLLOWING IN Σ NOTATION, (BEGINNING WITH $r=1$)

- (a) $1 + 2 + 3 + 4 + \dots + n$
- (b) $1 + 2 + 3 + 4 + \dots + 50$
- (c) $1^2 + 2^2 + 3^2 + \dots + 50^2$
- (d) $1^3 + 2^3 + 3^3 + \dots + 50^3$
- (e) $2^1 + 2^2 + 2^3 + 2^4 + \dots + 2^{13}$
- (f) $(3/4)^1 + (3/4)^2 + (3/4)^3 + \dots + (3/4)^8$
- (g) $1 + x + x^2 + x^3 + \dots + x^n$
- (h) $\frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \dots + \frac{1}{47}$

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- 1. (a) 14 (b) 162 (c) 16 (d) 25 (e) 125 (f) 1/3 (g) -3 (h) $\frac{1}{2}$ (i) 1/8
- (j) 6/7 (k) 14/19 (l) 10/243 (m) 32/243 (n) 5/8 (o) 36/7
- 2. (i) 1, 5, 9, 13, 17; sum = 45 (ii) 197 (iii) 17th term (iv) 301
- 3. (i) 77, 74, 71, 68; sum = 290 (ii) 35; 27th term (iii) belongs; 22nd term
- 4. (i) $\frac{1}{4}, \frac{1}{2}, 1, 2, 4, 8$; sum = $15\frac{3}{4}$ (ii) 11th term (iii) 1024
- 5. (i) -1, 4, -9, 16, -25; sum = -15 (ii) 400
- 6. $u_1 = 6, u_7 = 69$ (i) u_9 (ii) 56
- 7. (i) 5/4, 7/7, 9/10, 11/13 (ii) 1, 5, 19, 65 (iii) -3, 8, -13, 18
- (iv) $x/1, x^2/2, x^3/3, x^4/4$ (v) $a, a+d, a+2d, a+3d$ (vi) a, ar, ar^2, ar^3
- 8. (i) 29th (ii) 9th (iii) 30 (iv) 30 (v) 0 (vi) 100 (vii) 32 (viii) 3
- (ix) 34 (x) 0
- 9. $\sum_{r=1}^n r$ (ii) $\sum_{r=1}^{50} r^2$ (iii) $\sum_{r=1}^{50} r^3$ (iv) $\sum_{r=1}^{50} r$ (v) $\sum_{r=1}^{13} 2^r$ (vi) $\sum_{r=1}^8 (3/4)^r$ (vii) $\sum_{r=1}^{n+1} x^{r-1}$
- 10. (a) 46 (b) $\sum_{r=1}^n 1/(r+1)$

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